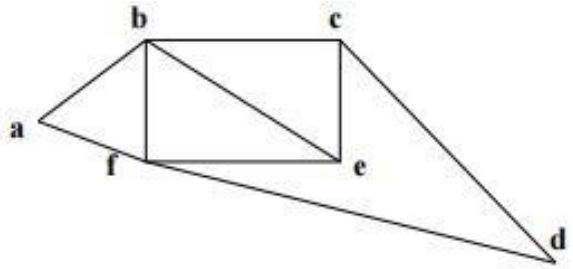
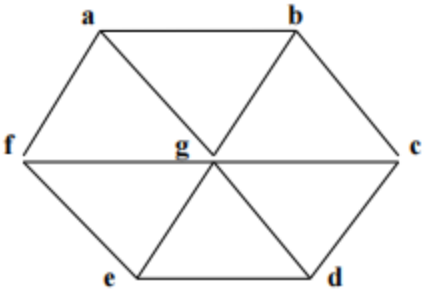
Exercise1:

1) Construct the adjoint graphs of the following graphs:



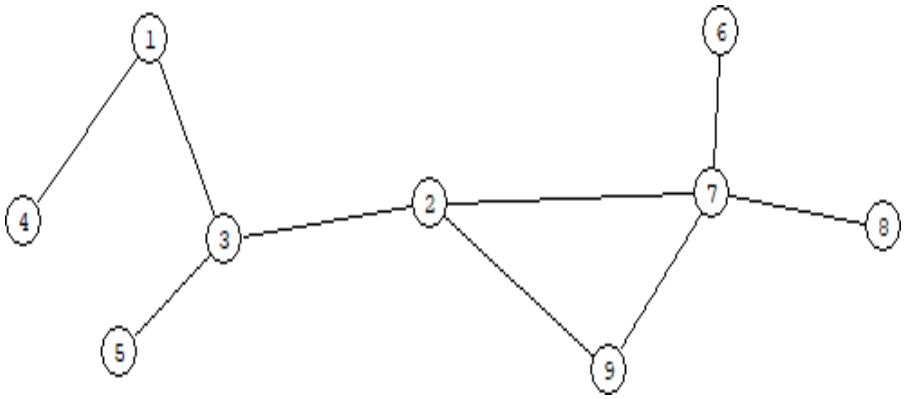
2) What is the number of edges of an adjoint graphs as a function of the degrees of the vertices of a graph?

3) What is the chromatic number of the following graph:



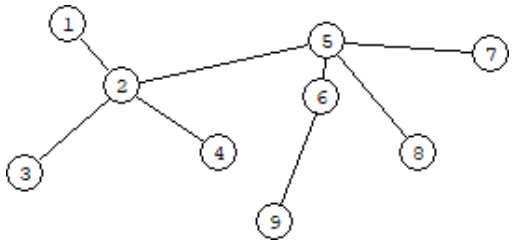
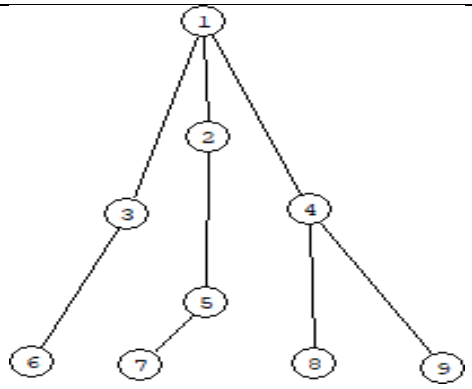
Exercise 2:

Indicate the isthmuses in the graph below:



Exercise3:

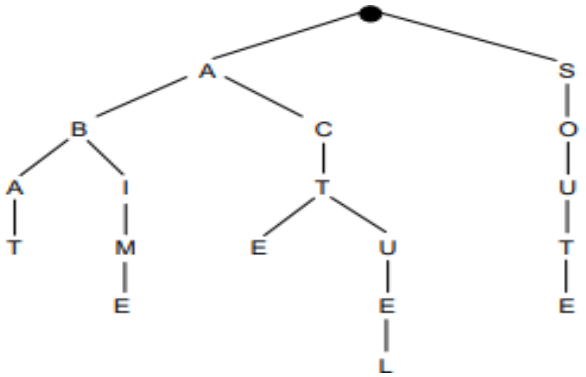
1. Indicate for each graph the number of edges and the number of isthmuses.
2. What is the type of these graphs?
3. What do you notice?
4. Modify these graphs to make them *rooted trees*.

Graph1	**Graph2**
	

Exercise4:

The tree below encodes a "dictionary" composed of the five words ABAT, ABIME, ACTE, ACTUEL and SOUTE.

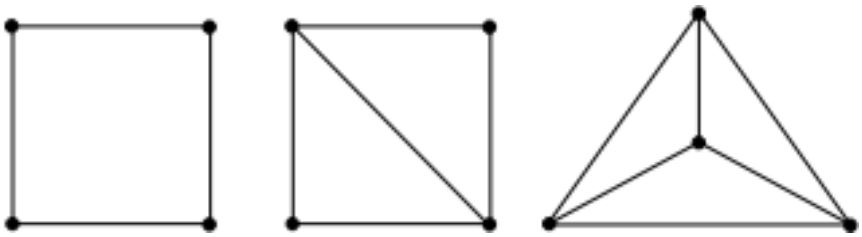
1. We want to include the words ORT in this dictionary. What happens to the tree?
2. We now want to include the word SOU. However, since the word SOUTE is already present, the word SOU is “already constructed” in this tree…How then can we distinguish the word SOU and the word ABI which do not belong to the dictionary?



3. Explain how, using such a tree, it is possible to determine whether a given word belongs to the dictionary or not.

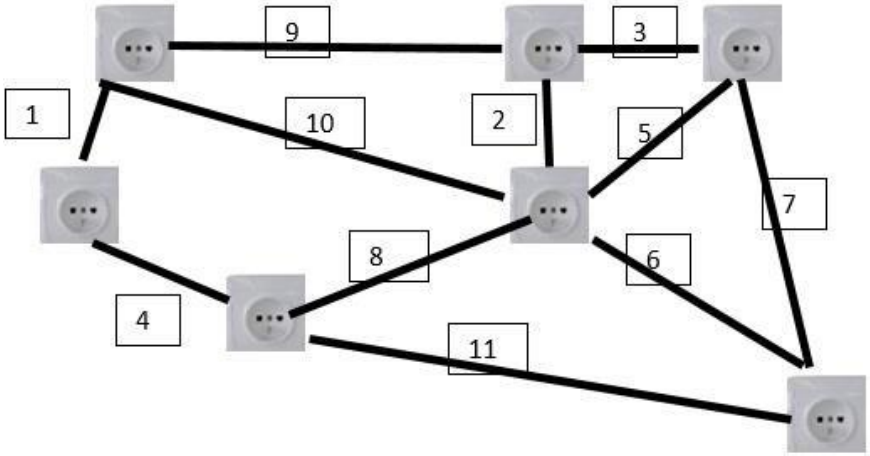
Exercise5:

Find the number of all spanning trees of the undirected graphs below



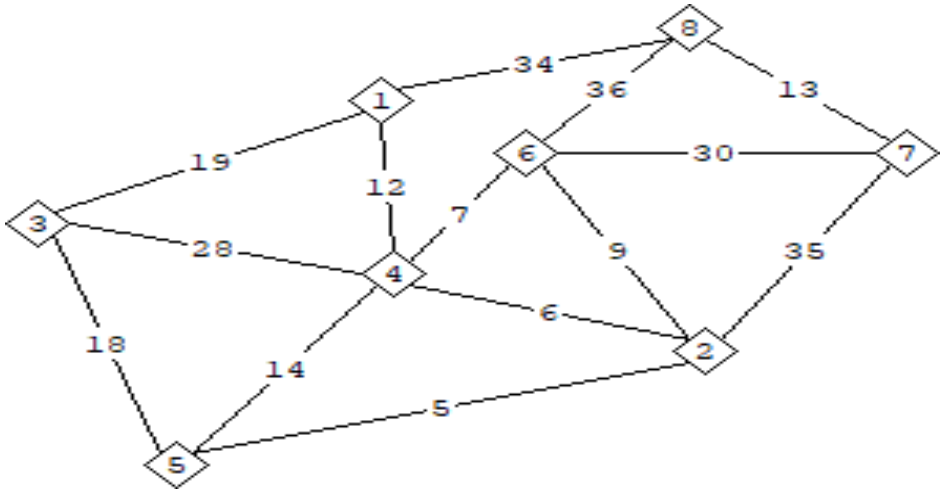
Exercise6:

1. Choose the shortest set of cables to connect all the sockets (the electrical wire is expensive per meter and we want to minimize the installation price).
2. Calculate the length of the electrical wire used.



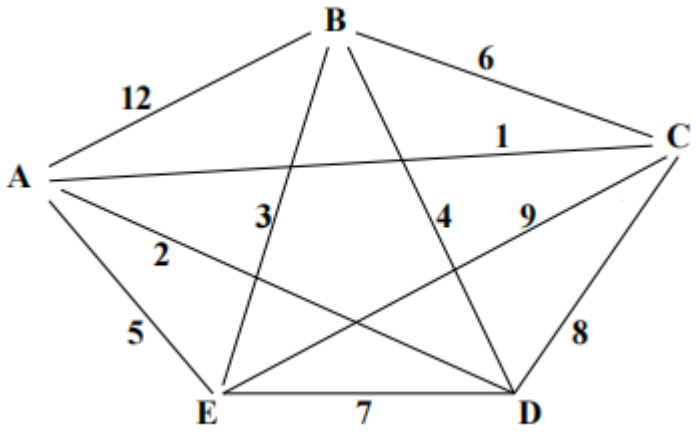
Exercise7:

1. Extract the minimum spanning tree according to Kruskal then according toPrim.
2. Deduce the weight of the tree.



Exercise8:

1. Apply the KRUSKAL algorithm, then the PRIM algorithm to find the minimum spanning tree, in the following graph:



2. Find a minimum spanning tree by applying Kruskal's algorithm on the graph below: